THE POTENTIAL THREAT OF CHINA-MYANMAR GAS PIPELINE

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Abstrak

Cina membutuhkan energi untuk menopang pertumbuhan ekonominya. Namun jumlah sumber energi di China tidak mencukupi sementara konsumsi energi tumbuh dengan cepat. Baru-baru ini, China merupakan konsumen energi terbesar kedua. Untuk mencapai keamanan energi dan mengurangi emisi karbon untuk menyelamatkan lingkungan, China secara aktif meningkatkan konsumsi gas alam. China mengimpor gas alam dari luar negeri seperti dari Timur Tengah, Kazakhstan, Turkmenistan dan lain-lain. Sekitar setengah dari sumber energi China diimpor dari sumber luar negeri. Namun, impor gas alam dari negara-negara ini beresiko. Ketidakstabilan politik di daerah tersebut mempengaruhi harga gas alam, ketidakamanan perjalanan gas alam melalui laut dapat mengurangi jumlah gas alam yang datang ke China, dan seterusnya. China kemudian melihat negara-negara alternatif yang lebih dekat ke China untuk memasok dan mengamankan permintaan energinya. Dengan demikian, pada tahun 2008 Cina menandatangani kesepakatan dengan Myanmar untuk membangun jaringan pipa gas. Jaringan pipa gas telah beroperasi pada Juli 2013. Namun, proyek pipa gas China-Myanmar tidak datang tanpa risiko. Makalah ini membahas potensi risiko jaringan pipa gas China-Myanmar. Makalah ini berpendapat ada keamanan, lingkungan, dan cyber, dan isu lainnya yang dapat menjadi ancaman potensial bagi proyek pipa gas Myanmar China.

Kata kunci: China, Myanmar, Gas, Pipa, Resiko

Abstract

China needs energy to sustain its economic growth. However the amount of energy resources in China are insufficient while the energy consumption grows rapidly. Recently, China is the second largest energy consumer. In order to achieve energy security and reduce carbon emissions to save environment, China is actively increasing the consumption of natural gas. China imports natural gas from overseas such as from Middle East, Kazakhstan, Turkmenistan and others. About half of China's energy resources import from foreign sources. However, Import natural gas from these countries come with risks. The instability of politic in those areas influences the natural gas price, insecurity of travelling the natural gas via sea can reduce the amount natural gas come to China, and so on. China then looks alternative countries that closer to China to

supply and secure its energy demand. In doing so, in 2008 China signed agreement with Myanmar to build oil gas pipeline. The gas pipelines have operated in July 2013. However, China-Myanmar gas pipelines project do not come without risk. This paper examines potential risks of China-Myanmar gas pipelines. This paper argues there are security, environmental, and cyber, and other issues that can be potential threat to China Myanmar gas pipeline project.

Keywords: China, Myanmar, Gas, Pipeline, Risk

Introduction

Based on British Petroleum (BP) statistical report in 2013, 88% China's energy resources were from coal and oil and 12% from natural gas and non-fossil fuel in 2012.[1] This proportion indicates China use high carbon energy resources. China is the largest carbon dioxide emitting country.[2] As a result, China gets pressure from international community to change this condition. For example in United Nations Summit 2014, US pressed China to reduce 45% of its carbon emission and ask China to commit about that.[3]

Facing this problem China has to change its energy consumption structure. China has to increase the consumption of low-carbon energy resources. One of the lowest carbon energy resources is natural gas. China plans to consume natural gas 260 billion cubic meters (bcm) in 2015 and will rise to 350bcm in 2020.[4] However, China does not have adequate natural gas resources to implement its low carbon energy consumption plan. In 2010 China's natural gas production was only 96,76 cubic meters.[5] As a result, China has to import natural gas from overseas such as from Myanmar, central Asia Kazakhstan, Turkmenistan and others.

Importing energy resources from central Asia and Middle East is not without risk to China. Zhao argues there are two causes why China faces potential constrains problem while import oil and natural gas from overseas.[6] First the political instability from crude oil and natural gas import country. In political instability countries conflict between government and civilian can be happened anytime. This situation can impact the stability of energy resource. For example in 2012 Sudanese rebels in the South Kordofan region kidnapped dozens of Chinese construction oil field installation workers.[7] The Sudanese rebels aimed to pressure China to use its influence to ask Sudanese government to stop attacking rebellion group. This situation interrupt China seek to oil, means that China had to do other efforts to save its energy resources.

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[1] Petroleoum, B. 2013. "BP Statistical Review of World Energy June 2013". London: Pure print Group Limited. P.3. available online at http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2013.pdf accessed 1 Novermber 2014

[2] Wang, J., Feng, L., Zhao, L. & Snowden, S. 2013. "China's natural gas: Resources, production and its impacts". *Energy Policy,* 55**,** p.690

[3] Landler, M. & Davenport, C. 2014. "Obama Presses Chinese to Move to Curb Warming". *New York Times*, 09/24/2014. Available online at http://www.nytimes.com/2014/09/24/world/asia/obama-at-un-climate-summit-calls-for-vast-international-effort.html, accessed 1 November 2014

[4] Jianming, Y., Ping, H. C., To, C. C. & On, L. C. 2013. "China Energy Fund Committee Survey Article on Natural Gas Development in China and its 12th Five-year Plan". *In:* Committee, C. E. F. (ed.) *China Energy Focus Natural Gas 2013.* Arlington: China Energy fund Committee.p.20

[5] Petroleoum, B. 2011. "BP Statistical Review of World Energy June 2011". London: Pure print Group Limited. P.12. available online at http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2011.pdf accessed 1 Novermber 2014

[6] Zhao, H. 2011. "China–Myanmar Energy Cooperation and Its Regional Implications". *Journal Of Current Southeast Asian Affairs,* 30**,** P.95

[7] Bariyo, N. 2014. "China Deploys Troops in South Sudan to Defend Oil Fields, Workers; Deployment Marks Sharp Escalation in Beijing's Efforts to Protect Interests in Africa". *Wall Street Journal (Online)*, 09/09/2014 Sep 09.available online at http://online.wsj.com/articles/china-deploys-troops-in-south-sudan-to-defend-oil-fields-workers-1410275041,accessed 1 November 2014

Second, the vulnerability of Malacca Strait.[8] China's natural gas and crude oil from Middle East and Persia Gulf are shipped via Southeast Asia sea lanes, the Strait of Malacca. The problem is there are many pirate attacks and transnational terrorist groups that disrupt maritime traffic and global commerce.[9] This territory is part of Indonesia and Malaysia sovereignty, which means Indonesia and Malaysia have responsible to secure this area. However, because of sovereignty, Indonesian and Malaysian Government reject external party such as China to contribute to patrol in this area. As a result China lack of power to protect its crude oil and natural gas in this area and there is potential threat of China's oil and gas are attacked by pirate.[10]

China needs to find another way to secure its energy and fulfil its demand. Erickson believes that China can invest in pipelines to deliver oil from the nearest oil producer countries to protect its oil and gas imports from possible conflict.[11] The nearest oil and natural gas producer to China is Southeast Asia. Southeast Asia has large reserves of oil and natural gas, and has long played as an exporter of oil and gas.[12] Based on BP statistical review in 2011, Southeast Asia has 6.6 tcm (trillion cubic metres) natural gas stocks.[13] This region's natural gas is much more than its oil. Indonesia, Malaysia and Brunei are major natural gas producers in Southeast Asia. In 2011 Indonesia produced 82bcm natural gas and consumed 40.3bcm.[14] Malaysia produced 66.5bcm and consumed 35.7bcm in the same year.[15] However, the amount of these countries consumption on natural gas increase every year to support their industry domestically and this amount will not be enough for domestic demand by 2030.[16]

Myanmar is also one of gas exporters in Southeast Asia. The amount of natural gas in Myanmar is much. However due to lack of refinery facilities and drilling facilities this country cannot use its natural gas optimally.[17] In 2010,

[8] Zhao, H. 2011. "China–Myanmar Energy Cooperation and Its Regional Implications". *Journal Of Current Southeast Asian Affairs,* 30**,** P.96

[9] Chuen-Ho, C. & Larry 2013. "China's Natural Gas Imports". *In:* COMMITTEE, C. E. F. (ed.) *China Energy Focus Natural Gas 2013.* Arlington: China Energy fund Committee. P. 138

[10] Zubir, M. & Basiron, M. N. 2005. "The Strait of Malacca: the Rise of China, America's Intentions and the Dilemma of the Littoral States".*Maritime Studies***,** 141, p.

[11] Erickson, A. S. & Collins, G. B. 2010. "China's Oil Security Pipe Dream: The Reality, and Strategic Consequences, of Seaborne Imports". *Naval War College Review,* 63**,** p.90

[12] Zhao, H. 2011. "China–Myanmar Energy Cooperation and Its Regional Implications". *Journal Of Current Southeast Asian Affairs,* 30**,** P.96

[13] Petroleoum, B. 2012. "BP Statistical Review of World Energy June 2012". London: Pure print Group Limited. P.16. available online at http://www.bp.com/content/dam/bp/pdf/Statistical-Review-2012/statistical_review_of_world_energy_2012.pdf accessed 1 Novermber 2014

[14] Petroleoum, B. 2013. "BP Statistical Review of World Energy June 2013". London: Pure print Group Limited. P.20 available online at http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2013.pdf accessed 1 Novermber 2014

[15] Petroleoum, B. 2013. "BP Statistical Review of World Energy June 2013". London: Pure print Group Limited. P.20 available online at http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2013.pdf accessed 1 Novermber 2014

[16] Jianming, Y., Ping, H. C., To, C. C. & On, L. C. 2013. "Perspectives on China's Natural Gas Development". *In:* Committee, C. E. F. (ed.) *China Energy Focus Natural Gas 2013.* Arlington: China Energy fund Committee. P. 61

[17] Cabalu, H. & Alfonso, C. 2012. "Energy Security in Asia: The Case of Natural Gas". *In:* Dorsman, A., Simpson, J. L. & Westerman, W. (eds.) *Energy Economics and Financial Markets.* London: Springer.p.23

Myanmar had natural gas reserve was 300bcm or 0.2% world gas reserves.[18] Looking at this potential in 2008 China National Petroleum Corporation (CNPC) and the Ministry of Energy Myanmar signed an agreement to build a gas pipeline with amount USD 2 billion.[19] This project is expected to supply 12bcm China's natural gas every year.[20] The construction began at 2009 and In July 2013 this gas pipelines project have fully operated. It will cover 10% of China's natural gas demand.[21] Although China can rely on this project, it does not come without risk. According to Dow, cross-border pipelines can generate conflicts and problem.[22] Therefore, this essay examines the potential risk of China-Myanmar gas pipelines. There are security, environment, cyber issue that can threat the gas pipelines project.

China Myanmar Gas Pipeline Project

Before 1988 Myanmar's government prohibited foreign to explore Myanmar's oil and gas. But since 2000 Myanmar has become one of the largest natural gas exporting countries in the Asia Pacific region because State Law and Order Restoration Council (SLORC) allowed foreign country to cooperate with Myanmar's oil and gas.[23] China was not interesting in Myanmar natural gas before. China primary partner in energy sources are Middle East and Central Asia country. However, due to energy demand and avoid risk of oil and natural gas distribution from those areas, China seeks Myanmar as its partner. As a result, in 2008 CNPC signed contract with Myanmar's government to explore Myanmar's natural gas for 30 years.[24] China will also become Myanmar largest stable gas buyer.[25] This project's value was USD 2 Billion to build gas pipeline known as Shwe Project. This pipeline started to construct in October 2009 and was predicted to finish in March 2013. However, because of technical problem, this gas pipeline operated fully in October 2013.[26]

[18] Petroleoum, B. 2012. "BP Statistical Review of World Energy June 2012". London: Pure print Group Limited. P.20. available online at http://www.bp.com/content/dam/bp/pdf/Statistical-Review-2012/statistical_review_of_world_energy_2012.pdf accessed 1 November 2014

[19] Erickson, A. S. & Collins, G. B. 2010. "China's Oil Security Pipe Dream: The Reality, and Strategic Consequences, of Seaborne Imports". *Naval War College Review,* 63**,** p.93

[20] Srinivas, A. 2014. "Sino-Myanmar Oil & Gas Pipelines and their Implications for India". *Global Journal of Finance and Management,* 6**,** p.951.

[21] Wang, J., Feng, L., Zhao, L. & Snowden, S. 2013. "China's natural gas: Resources, production and its impacts". *Energy Policy,* 55**,** p.692

[22] Dow, S., Siddiky, I. A. & Ahmmad, Y. K. 2013. "Cross-border oil and gas pipelines and cross-border waterways: a comparison between the two legal regimes". *The Journal of World Energy Law & Business,* 6**,** p.116

[23] Kolås, Å. 2007. "Burma in the Balance: The Geopolitics of Gas". *Strategic Analysis,* 31**,** p.628

[24] Hilton, I. 2013. "China in Myanmar: implications for the future". The Norwegian Peace building Resource Centre. P. 5 available online at http://www.peacebuilding.no/var/ezflow_site/storage/original/application/822f00b4d7da6439a3252789b404f006.pdf, accessed, 1 November 2014

[25] Srinivas, A. 2014. "Sino-Myanmar Oil & Gas Pipelines and their Implications for India". *Global Journal of Finance and Management,* 6**,** p.952

[26] Hui,Li, "China-Myanmar gas pipeline in full operation".20 October 2014,Xinhuanet.available online at http://news.xinhuanet.com/english/china/2013-10/20/c_132814560.htm,accessed, 1 November 2014

China-Myanmar gas pipeline is built in Arakan State in Shwe fields natural gas to Kunming, in Yunan Province in China.[27] This gas pipelines, the onshore gas has built in 793km from Myanmar to China. South-East Asia Pipeline Company Limited (SEAP) and Shwe Consortium member construct and operate this gas pipeline with CNPC that hold 51% of ownership.[28]While Myanmar's government will provide security for the pipelines.[29] The pipelines pass river, mountain, village, and Myanmar's conflict zone. But the Myanmar's government has guarantees to secure the pipeline route. The government has placed 28 Burmese Army battalions in pipelines route from Arakan state to China border until the project finished.[30]

This project will help both parties to develop their economic growth. From China side, as the pipeline is expected to send 12bcm natural gas per year, it hopes will reduce 30.72 million tonnes Chinese coal consumption to reduce its carbon emission per year.[31] Further, this gas pipeline will assist China to shorter its crude oil route from Middle East because it is also built parallel pipeline for crude oil with natural gas pipeline, and more secure because can avoid Malacca Strait route. Moreover, China can develop its southwest area, Yunnan, Tibet, Guizhou economic development as these areas are lack of fuel supplies and the natural gas will deliver firstly to Yunan.[32]

From Myanmar Side, this project will reduce Myanmar dependent on Thailand. Before, Myanmar only cooperates with Thailand and much amount of its natural resources only export to Thailand.[33] Zhao also believes that this gas pipelines will increase Myanmar Foreign Direct Investment (FDI).[34] Myanmar's government can earn 900 million per year from gas sale to China if they can distribute 12bcm per year and could increase as predicted it will deliver 24bcm by 2019 to China.[35]

Although China Myanmar gas pipeline sound good that China can rely on this project, there are potential risks with this project. Erickson argues that China-Myanmar pipeline are more vulnerable to sabotage and military

[27] Kolås, Å. 2007. "Burma in the Balance: The Geopolitics of Gas". *Strategic Analysis,* 31**,** p.625
[28] International, E. 2011. "The Burma-China Pipelines: Human Rights Violations, Applicable Law, and Revenue Secrecy". Chiang Mai: EarthRights International.p.3 available online at, http://www.earthrights.org/sites/default/files/documents/the-burma-china-pipelines.pdf, accessed, 1 Novembe 2014
[29] CNPC,2009."Rights and obligation agreement signed of Myanmar-China Crude Pipeline", Dec. 21, 2009, *available at* http://www.cnpc.com.cn/en/press/ newsreleases/, accessed, 1 November 2014
[30] International, E. 2011. "The Burma-China Pipelines: Human Rights Violations, Applicable Law, and Revenue Secrecy". Chiang Mai: EarthRights International.p.5 available online at, http://www.earthrights.org/sites/default/files/documents/the-burma-china-pipelines.pdf, accessed, 1 Novembe 2014
[31] Yi,Li.2014"China-Myanmar oil and gas pipelines: a $5 billion problem",05/July/2014,China dialog, available online at https://www.chinadialogue.net/article/show/single/en/6183-China-Myanmar-oil-and-gas-pipelines-a-5-billion-problem-, accessed 1 November 2014
[32] Erickson, p.92
[33] Zhao, p.100
[34] Zhao, p. 100
[35] Movement, S. G. 2013. Drawing The Line *The Case Against China's Shwe Gas Project,For Better Extractive Industries In Burma.* Kyakyuphu: Shwe Gas Movement.p. 6 Available online at http://www.shwe.org/wp-content/uploads/2013/09/SGM-DTL-Press-Release.pdf,accessed, 1 November 2014

interdiction. This pipeline can be blocked and physical attacked by non-state actors and other parties.[36]

Security threat

The security of pipeline is doubtful because passes to areas controlled by ethnic militias. Youqi states that the safety of gas and oil pipeline in Myanmar seems even worse compared to the situation of Straits of Malacca which over 50 kilometres of the oil and gas pipelines are in the war zone.[37] The pipelines pass the northern part of the Shan State in Myanmar known as insurgency prone areas which is controlled by ethnic militia that refuse to ceasefire with Myanmar government.[38] To deliver gas to China, gas pipelines from Myanmar travel across mountains, surging rivers, and virgin forest. These areas are vulnerable to sabotaged by ethnic militia. Although Myanmar's government has placed Myanmar's security force to secure the pipeline, they do not place them many in northern part of Shan state of Myanmar where the pipeline pass.[39]

Tatmadaw army (Myanmar armed force) is one of Myanmar's force operate in Northern Shan state to secure this area. However, there are many confrontations or fights occur frequently between Tatmadaw army and the United Wa State Army (UWSA) and the Kachin Independence Army (KIA). Both of these army are the militia ethnic group operate in Shan State.[40] The confrontation between them can harm the safety of pipeline. For example during Konkan incident in 2009 that ethnic insurgent groups confronted with Tatmadaw and caused destruction of infrastructure and heavy goods for pipelines.[41] On September 23, 2011, the Myanmar government's force attacked the KIA's territory in Shan State in the name of protecting the safety of the oil and gas pipeline construction and cause clashed between them.[42] Such these clash often occurs which mean China's pipeline remain vulnerable in times comes. Lies gas pipeline in an area where armed conflict occurs frequently of course is not a good idea. An explosion can cause anytime caused by a stray bullet when conflict parties clash. If the bullet can penetrate the pipeline it will explode and can cause significant damage to surrounding area.

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[36] Erickson, p. 92

[37] Youqi, Z., Weibu, G. Q. & Hongwei, Y. 2013."The prospects of the Sino-Myanmar oil and gas pipeline". *Phoenix Weekly,* 482**,** p.44

[38] Shivananda H, 2012,'China's Pipelines in Myanmar". January 10, 2012,Institute for Defences Studies and Analyses, available online at, http://www.idsa.in/idsacomments/ChinasPipelinesinMyanmar_shivananda_100112.html,accessed 1 November 2014

[39] Hong, Z. 2013. "The China-Myanmar Energy Pipelines: Risks And Benefits". *Iseas Perspective,* 30**,**P.6

[40] Shivananda H, 2012,"China's Pipelines in Myanmar". January 10, 2012,Institute for Defences Studies and Analyses, available online at, http://www.idsa.in/idsacomments/ChinasPipelinesinMyanmar_shivananda_100112.html,accessed 1 November

[41] Movement, S. G. 2009. "Drawing The Line *The Case Against China's Shwe Gas Project,For Better Extractive Industries In Burma".* Kyakyuphu: Shwe Gas Movement.p. 3 Available online at http://www.shwe.org/wp-content/uploads/2013/09/SGM-DTL-Press-Release.pdf,accessed, 1 November 2014

[42] Youqi, p.45

China needs to pay attention to this problem. But not much China can do since the conflict occurs in Myanmar which is related to Myanmar's sovereignty and China has no right to intervene although China has interest in Myanmar through its pipeline. However, possible ways that China can do to safe its pipeline may be through show good attitude to Myanmar so Myanmar will also give good respond to China's interest in Myanmar. For example China has to stop its illegal arms trade with UWSA which are well known to reduce number of conflict with Myanmar government.[43] China can pay attention to Burmese refugee who usually migrates due to conflict in Myanmar to Yunan province in China. Such as in 2009 during Konkan incident there were 13,000 Burmese being refugee to China to avoid a big conflict.[44]

Environmental Problem of Gas Pipeline

China Myanmar gas pipelines is criticized from NGOs and activist. China has to aware about this issue. China-Myanmar gas pipelines project have potential pressure and shut down from non-state actor if the corporations operate in the project do not adhere to international environmental standard of environment impact assessment (EIA) and do not concern on human rights. In other words, China gas pipelines can close If Chinese firms exploit natural resources in Myanmar excessively without considering environmental sustainability.[45] For example in 2012 Anti-pipeline NGOs, Shwe Gas Movement (SGM), earth right international, Myanmar-China Pipeline Watch Committee asked Myanmar's government for a suspension of the project due to environmental impacts, social concerns and human rights abuses.[46] Further, Su believes that China's exploitation of Myanmar's rich natural resources on oil and gas pipelines has created serious problems; China brings irreversible environmental and social impact to Myanmar.[47]

However, Chinese Ministry of Foreign Affairs spokesman Hong Lei said "cooperation between China and Myanmar is on the basis of mutual equality. China pays close attention to ecological protection and requires Chinese companies operating outside its borders to obey local environmental and other laws".[48] In addition, CPNC website released statement that environmental protection is a top concern of China Myanmar oil-gas pipelines construction.

[43] Group, I. C. 2010. "China's Myanmar Strategy: Elections, Ethnic Politics and Economics."Brussels International Crisis Group.p. 3 Available online at http://www.crisisgroup.org/~/media/Files/asia/north-east-asia/B112%20Chinas%20Myanmar%20Strategy%20%20Elections%20Ethnic%20Politics%20and%20Economics.pdf, accessed 1 November 2014

[44] International Crisis Group, p. 5

[45] Kudo, T. 2008. "Myanmar's economic relations with China: who benefits and who pays?" *In:* Skidmore, M. & Wilson, T. (eds.) *Dictatorship, Disorder and Decline in Myanmar.* Canberra: ANU E Press.p.101

[46] Shwe Gas movement, 2012,"NGO's Call for Suspension of Shwe Gas project", 12 October, 2012, avalailbe online at, http://www.shwe.org/ngos-call-for-suspension-of-shwe-gas-project/,accessed 2 November 2014

[47] Sun, Y. 2012. "China and Changing Myanmar" *Current Southeast Asian Affairs,* 31,p. 57

[48] Back, Aaron,2011, "China Urged to Halt Myanmar Dams",6 July, 2011, the wall street Journal, available online at,http://online.wsj.com/articles/SB10001424052702303982504576427753473877610,accessed , 2 November 2013

Environmental protection are included in all contract which signed by contractor operating in China-Myanmar gas pipeline to aware about their environmental responsibility[49]. It is also stated that "Since its start, the construction process has been in strict compliance with the requirements and specifications set forth in the EIA report to protect the ecological environment effectively in the areas alongside the pipelines. So far, there has been no environmental pollution or ecological damage accident".[50]

The construction of gas pipelines is not free from environmental damage. From report released by Shwe Gas Movement states that one third of the coral reefs in north of Kyak Phyu town are in serious damage because of dynamite dredging.[51] This dynamite was used to clear the route for the undersea natural gas pipeline. The reefs are crucial habitat for fish and marine life. Damaging of this reef can cause bad effect to local fishing industry.[52]

China Myanmar gas pipelines project also can harm flora and fauna in Myanmar as this pipelines pass forest. The pipelines pass western mountain range of Myanmar that is part of Himalayan ecological region. In this area there are many endangered species. According to Earthright International report, open this area for pipeline route will destroy the habitat live there, increase wildlife poaching, segment ecologically sensitive areas and animal passageways, and increase deforestation and soil erosion.[53] The gas pipelines project construction also cut mangrove in Arakan state. The mangrove is important for coastal protection from monsoon storms that often occurs in Arakan state. The gas pipelines construction destroyed around 60,000 square acres mangrove. This can cause people in Arakan more vulnerable from cyclones and storm surges.[54]

Another issue that CNPC has to pay attention is the safety of gas pipeline. Exploding of gas pipeline can cause big damage especially if occurs near populated area. In April 2013 the explosions occurred during safety checks in Nanhkan and Namtu townships while workers cleaning the pipeline.[55] On a SGM 2013 report from its interview with Northern Shan Farmers states that "holes were seen in the pipes before they were laid underground and worker fixed the holes with rubber patches like tyre puncture.[56] Such this issue can cause

[49] CNPC,"Caring for Communities along the Myanmar China Oil and Gas Pipelines". Available online at http://www.cnpc.com.cn/en/CaringforcommunitiesalongtheMyanmarChinaOilGasPipelines/CaringforcommunitiesalongtheMyanmarChinaOilGasPipelines.shtml, accessed 1 November, 2014

[50] CNPC,"Caring for Communities along the Myanmar China Oil and Gas Pipelines". Available online at http://www.cnpc.com.cn/en/CaringforcommunitiesalongtheMyanmarChinaOilGasPipelines/CaringforcommunitiesalongtheMyanmarChinaOilGasPipelines.shtml,accessed 1 November 2014

[51] SGM. 2011. "Sold Out. *Alunch of China Pipeline Project Unleashes Abuse Across Burma".* Kyakyuphu: Shwe Gas Movement.p.12

[52] SGM. 2009. Corridor of Power. *China's trans Burma Oil and Gas Pipeline.* Kyakyuphu: Shwe Gas Movement.p.18

[53] SGM. 2011. "Sold Out. *A launch of China Pipeline Project Unleashes Abuse Across Burma".* Kyakyuphu: Shwe Gas Movement.p.29

[54] SGM. 2009. Corridor of Power. *China's trans Burma Oil and Gas Pipeline.* Kyakyuphu: Shwe Gas Movement.p.25.

[55] Nyein,Nyein.2013. Shwe Pipeline Explosions Highlight Safety Concerns,9April,2013, the Irrawaddy, Available online at http://www.irrawaddy.org/burma/shwe-pipeline-explosions-highlight-safety-concerns.html, accessed 2 November, 2014

[56] SGM.2013. "Drawing The Line *The Case Against China's Shwe Gas Project,For Better Extractive Industries In Burma".* Kyakyuphu: Shwe Gas Movement.P.25

explosion any time in gas pipelines. CNPC needs to maintain its gas pipelines continually to avoid this accident. The pipelines is a long route and pass many kind areas. From economic views, an explosion of course can cause deficit in gas received in China and CNPC needs to pay compensation for the accident. So, before the accident occurs, this is important to check the safety of the pipelines and make sure the operation will not cause environmental damage.

Cyber-Attack and Competition with Other Countries

Although until now there is no evident or accident China Myanmar gas pipelines attacked by cyber, this attack could be happened in the future. Natural gas is one of China's important infrastructures recently. According to Rudner critical infrastructure are susceptible to cyber-attack, such as energy infrastructure particularly petroleum facilities, pipelines and oil tanker, energy companies, transportation and financial service. [57]

The aim of attacking energy infrastructure is to damage and weaken the economy of target country. Energy infrastructure has intrinsic vulnerabilities. So, attack an energy infrastructure can cause wide harm and effect to other sectors.[58] In doing so, usually cyber militancy who are doing cyber-attack to energy infrastructure manipulate or corrupt digital data to produce misinformation. Or they can impair the digitalized control system causing damage of the infrastructure function. Example of drawback of cyber-attacks to energy is The UK government estimates that oil and gas companies in the UK already lose approximately GBp400 million every year as a result of cyber-attacks.[59]

Frank believes that China's government is increasingly concern about the rise of cyber-attacks on its rapidly expanding oil and gas pipeline system.[60] However, China also suspect from cyber-attack in other countries for example in US. From December 2011 to June 2012, China's cyber spies targeted 23 gas pipeline companies in US.[61] China becomes suspect from many cyber-attacks to US infrastructure because from tracing doing by cyber security companies in US indicated that the attacks were from China. However, China's government rejected that China attacked US energy infrastructure, Geng Shuang, spokesman at the Chinese Embassy in Washington said "Cyber-attacks are transnational and anonymous, determining their origins is extremely difficult.

[57] Rudner, M. 2013. Cyber-Threats to Critical National Infrastructure: An Intelligence Challenge. *International Journal Of Intelligence And Counter Intelligence,* 26,P.451

[58] Somerville, R. 2014. *Cyber Attacks Can The Market Responds?,* Canada, Willis Limited. Cyber Threat To National, P.16

[59] Process Online,2014,"7 in 10 Australians fearful that cyber-attacks could damage Australia's economy",14 November 2014, available online at http://www.processonline.com.au/news/70928-7-in-1-Australians-fearful-that-cyber-attacks-could-damage-Australia-39-s-economy,accesed 3 November 2014

[60] Umbach, F. & Nerlich, U. 2011. "Asset Critically in European Gas Pipeline Systems- Increasing Challenges for NATO its Member states and industrial protection of Critical Energy Infrastructure". *In:* Gheorghe, A. & Muresan, L. (eds.) *Energy Security: International and Local Issues, Theoretical Perspectives, and Critical Energy Infrastructures.* Netherlands: Springer.p.281

[61] Hare, F. B. 2012. Homeland Security Investigates Cyber Attacks On Gas Pipelines. *Pipeline & Gas Journal,* 239**,** p.61.

Chinese laws prohibit cyber-attacks and China has done what it can to combat such activities in accordance with Chinese laws and regulations."[62]

Technically, hackers attack supervisory control and data acquisition (SCADA). SCADA is software that companies running gas pipelines use. This is a computerized gas pipeline control system. This system can control the operation of natural gas pipelines pumping station, valves, and the communication between one gas pipelines stations with others and so on.[63] Usually hackers will attack with malware so they can copy the information from SCADA and transfer it to hacker's computer. The effect of this attack is it can change the transportation of gas route, miscalculation of production and could explode a gas pipeline station.

Facing this phenomenon, there is possibility that China-Myanmar gas pipeline can be attacked by other parties as this is important infrastructure to China and across transnational (Myanmar- China). Attack a station can give impact to both parties, China and Myanmar. Further, China needs to be aware of Myanmar gas pipeline because this is just operating, still new and China has track record on attacking other countries energy infrastructure.

China has to aware of other issues that can threat its gas pipeline with Myanmar. For example about rivalry with India, India has been concerned about Myanmar's gas before China and had proposed it to Myanmar government before China. However, in 2009 Myanmar government turned to cooperation with China after its negotiations on several projects with India failed.[64] India also sees Myanmar as potential partner because geopolitics and its demand on energy. Cooperate with Myanmar can provide India with capable energy resources with short distance.

Moreover, China needs to pay attention in social issue. China needs to aware of social condition of Burmese affected with the construction of gas pipelines. SGM reports state that many Burmese complained about the amount of compensation given by CNPC too little. CNPC also do not provide other jobs for farmers which their field had been damaged to construct the gas pipelines. However, CPNC released in its website that compensation paid for the converted land. The compensation amount is negotiated based on local land price, villagers' offer and government quotation, involving the residents, village chiefs, local government, Ministry of Energy and MOGE officials, as well as the pipeline companies' representatives.[65] CNPC also built some schools building and

[62] Clayton,Mark,2013, "Exclusive: Cyberattack leaves natural gas pipelines vulnerable to sabotage," 27February2013,csmonitor, available online at http://www.csmonitor.com/Environment/2013/0227/Exclusive-Cyberattack-leaves-natural-gas-pipelines-vulnerable-to-sabotage,accessed 3 Novermber 2014

[63] Clayton,Mark,2013, "Exclusive: Cyberattack leaves natural gas pipelines vulnerable to sabotage," 27February2013,csmonitor, available online at http://www.csmonitor.com/Environment/2013/0227/Exclusive-Cyberattack-leaves-natural-gas-pipelines-vulnerable-to-sabotage,accessed 3 Novermber 2014

[64] Srinivas, A. 2014. "Sino-Myanmar Oil & Gas Pipelines and their Implications for India". *Global Journal of Finance and Management,* 6**,** p.953

[65] CNPC,"Caring for Communities along the Myanmar China Oil and Gas Pipelines". Available online at http://www.cnpc.com.cn/en/CaringforcommunitiesalongtheMyanmarChinaOilGasPipelines/CaringforcommunitiesalongtheMyanmarChinaOilGasPipelines.shtml,accessed 1 November 2014

hospitals for local Burmese. However, they only provide building and no other facilities such as teacher, books and so on. As a result no student can study in that building. The building is just stand as building not a school. Moreover, SGM also states that the company only provided money to the Myanmar government to realization of compensation to the local people which do not realize completely. As a result, local people in Arakan state protests and blockade the construction of project that increased the original investment from US$ 2.54 billion as the agreement in the beginning to US$ 5bilion.[66]

China needs to give its attention to such this issue. Although this issue seems a little problem, local people can blockade gas pipeline route and protest which can cause drawbacks to China. China needs to support Myanmar government to resolve such this issue as this issue is occur in Myanmar territory that China also has to respect to Myanmar's sovereignty. However, China can help Myanmar's government to cover this issue.

Conclusion

China is the second largest energy export country recently. China needs energy resources to sustain its economic growth. The importance of energy requires China to secure its energy resources. Facing security threat in Strait of Malacca and political instability in Middle East that can affect China's gas and oil supply, require China to find alternative energy resources. On the other hand, China needs to find energy resources that safe to environment. China known as a country uses much of oil and pollutes the environment. To overcome this problem, China shift to use natural gas that more save to environment. Facing these two problems China cooperates with Myanmar to build gas pipelines to deliver Myanmar's natural gas from Arakan state in Myanmar to Kunming in China. This agreement signed in 2009 between China's energy corporations CNPC with Myanmar's energy ministry to supply China's natural gas for 30 years. The gas pipeline project had constructed since 2009 to 2013. In October 2013, this project fully operated and travel gas from Myanmar to China. China Myanmar gas project is expected to supply 12bcm gas per year in China that count for 10% of China's natural gas demand.

Myanmar is one of natural gas import in Southeast Asia. Although the amount of natural gas and oil in this country is not much, the lack of refinery facilities cause this country can export its natural gas. To support China Myanmar gas pipelines project. There are two projects constructed, offshore and onshore. The liquid natural gas from Shwe project will directly deliver to China accros 792km.

However, China Myanmar gas pipelines project is not without risk or threat. Like delivery China's energy resources from Middle East that have many risks, China Myanmar gas pipelines also have threat. There are several threats that China has to aware about this gas pipelines project so China can fulfil its energy demand. They are security threat, environment, cyber and rivalry threat

[66] SGM.2013. "Drawing The Line *The Case Against China's Shwe Gas Project,For Better Extractive Industries In Burma".* Kyakyuphu: Shwe Gas Movement.P.2

and social condition of local people affected of the project that China needs to pay attention.

China Myanmar gas pipeline can be threatened from security condition in Myanmar. The gas pipelines across the area controlled by Myanmar's ethnic militia. There are potentials the gas pipelines blockaded by the ethnic. Although Myanmar's government provides security to secure the pipeline they do not place the troops in crucial area where there are many militia groups. Another thing there are many clashed or fight between Myanmar government troops and ethnic militia near the pipeline line. If the conflict occurs there is potential gas pipelines will explode because of bullet. Although China's government cannot intervene the security of Myanmar to secure its gas pipelines, China can help Myanmar government to solve this conflict, such as facilitate peace agreement between party, stop illegal arms trade with ethnic militia in Myanmar and others.

Environment also needs to pay attention. Since this project constructed, there are many environmental bad effect China leave in Myanmar. If China does not respond to it, China's project will face pressure from non-governmental organization due to not respect to the environment as EIA.

Cyber-attack also can be threat for China Myanmar gas pipelines project. Although no attack until now for China Myanmar gas pipelines project since it's fully operated. Cyber-attacks to energy infrastructure is one of world concern recently. Many states' energy infrastructure are attacked by cyber to steal the data and cause miscalculating of the energy resource production. Therefore, China needs to protect this pipeline from cyber-attacks as China also known as attacker in cyber, so there is also possibility China's gas pipeline will be attacked by other countries.

Another issues that China has to aware about this gas pipeline is rivalry with India that also concern about Myanmar gas and social condition in Myanmar. As social problem in Myanmar about dissatisfaction of Burmese compensation of gas pipeline project can cause them protest the project and stop the project temporarily.

To conclude, China needs to pay attention to small problem about the gas pipelines project to maintain its operation. Although there is no energy resource without risk, China can rely on Myanmar gas pipelines project as long as China pay great attention to the potential threat that can damage this project.

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